

# **International Dimensions**

## **GOFC/GOLD,**

(Global Observations of Forest Cover/Global  
Observations of Landcover Dynamics)

## **IGOS-P**

(Integrated Global Observation Strategy-Partnership)

## **I G O L**

(Integrated Global Observations of the Land)

## **GEOSS**

(Global Earth Observation System and Systems)

# What is GOFC/GOLD (Global Observations of Forest Cover/Global Observations of Landcover Dynamics)?

- **An ambitious, multifaceted international strategy to bring the Earth's land cover under continuous operational observation**
- **A Panel of the Global Terrestrial Observing System (GTOS), one of three Observing Systems supported by the International Global Observing Strategy (IGOS) Partners.**
- **A vision to share data, information and knowledge, leading to informed action and decision support.**
- **A network of participants implementing coordinated research, demonstration and operational projects using earth observation and other data effectively for global monitoring of terrestrial resources, global assessments and the study of global change.**
- **Establishing international standards and protocols especially with respect to issues like validation.**
- **An international organization of space agencies and end users**
- **A long term process of building an improved match between Observations, Data Products and User Needs**

# Membership and Participation

- Fire Implementation Team Co-chairs
  - Johan Goldammer
  - Chris Justice
- Land Cover Implementation Team Co-chairs
  - Dave Skole
  - Chris Schullius
- Validation Efforts
  - Alan Strahler
  - Jeff Privette
  - Jeff Morisette
- STB
  - John Townshend
  - Garik Gutman

# FAO Workshop on Harmonization of Global Land Cover Products

14-16 July 2004 **VENUE: FAO**, Rome, Italy

- **OVERVIEW AND BACKGROUND:** Growing need for detailed and accurate information about land cover and land cover change on all geographic scales. Based on a variety of maps and international mapping efforts, a variety regional and global land cover products have been derived (IGBP DisCover, MODIS land cover product, GLC 2000, CLC1990 and 2000 etc.) and are available to the scientific and user community.
- However, there is no common language between and among these different maps and their thematic legends. This undoubtedly hinders their application, in particular for analysis of changes, and complicates coordinated efforts in their validation.
- **GOFC-GOLD**, ESA, and GTOS with the Food and Agriculture Organization of the United Nations (**FAO**) have agreed to foster the harmonization and validation of global land cover products.

# OBJECTIVES OF THE MEETING

- Based on the accomplishments of the Jena-meeting, the workshop will focus on the following objectives:
- Development of the implementation strategy for harmonization of regional and global land cover products: -
- Apply the **FAO** Land Cover Classification System (LCCS-2) as common language and translator
  - Testbeds and harmonization case studies
  - Issues of scaling:
  - Local versus global harmonization
- Harmonization as part of global land cover validation efforts
- Update on progress of the GLOBCOVER project

## Joint GOFCC/GOLD and CEOS WGCV meeting on Validation

- Meeting February 2004, led by Alan Strahler at BU.
- Global Land Cover Validation Best Practices Document being prepared.
- Follow up meeting on Validation of Fractional Cover products at UMD, Fall 2004.

# Other meetings

- *Establishing procedures to generate consistent fire detection products* using geostationery satellite data, at Eumetsat at Darmstadt.
- *Regional meeting for Northern Europe and NW Russia* in St. Petersburg to establish a network for exchange and dissemination of land cover data sets.
  - The objective of the workshop is to link remote sensing with in-situ observations in support of research goals of Northern Eurasia Earth Science Partnership Initiative.
- *South-East Asia regional Burned Area Mapping Workshop* at Universiti Kebangsaan, Malaysia in early June.
- *Meeting of Land Cover Implementation Team* to reconfigure our the Team's plans, associated with the opening of the new GOFC-GOLD Land Cover activity at the University of Jena, funded by ESA.
  - Emphasis on collating and making available validation data sets

# IGOS Objectives



- “for the definition, development and implementation of an Integrated Global Observing Strategy”
- brings together efforts of a number of international agencies concerned with global environmental issues, research, and observing systems
- established in June 1998 by a formal exchange of letters amongst 13 founding Partners

# IGOS Partners

- the Global Observing Systems (GOS/GAW, GOOS, GTOS, GCOS)
- the international agencies which sponsor the Global Observing Systems (FAO, ICSU, IOC of UNESCO, UNEP, UNESCO, WMO)
- the Committee on Earth Observation Satellites (CEOS)
- the International Group of Funding Agencies for Global Change Research (IGFA)
- the international global change research programmes (WCRP, IGBP)

# Integrated Global Observation Strategy Partnership - Themes

- Purpose:
  - Gain international consensus on the key observations that need to be collected.
  - Establish implementation plans
- Process for developing themes :
  - Form a group of interested partners and internationally recognized experts
  - Consult user communities to define needs and products
  - Assess current status of observations
  - Identify gaps in coverage and actions required
- Theme content :
  - Objectives; Roles and responsibilities; Milestones; Evaluation criteria; Level of effort required

# IGOS Themes

**Under implementation :** - Oceans  
- Coral reefs sub-theme

**Ready for implementation :** - Carbon  
- Water  
- Geohazards

**Advanced development :** - Atmospheric chemistry  
- Coastal

**Under development :** -Land  
-Cryosphere

\* Note the IGOS Theme documents are being used as a primary source of requirements for developing the Global Earth Observing System of Systems (GEOSS) as part of the work of the Group on Earth Observations (GEO).

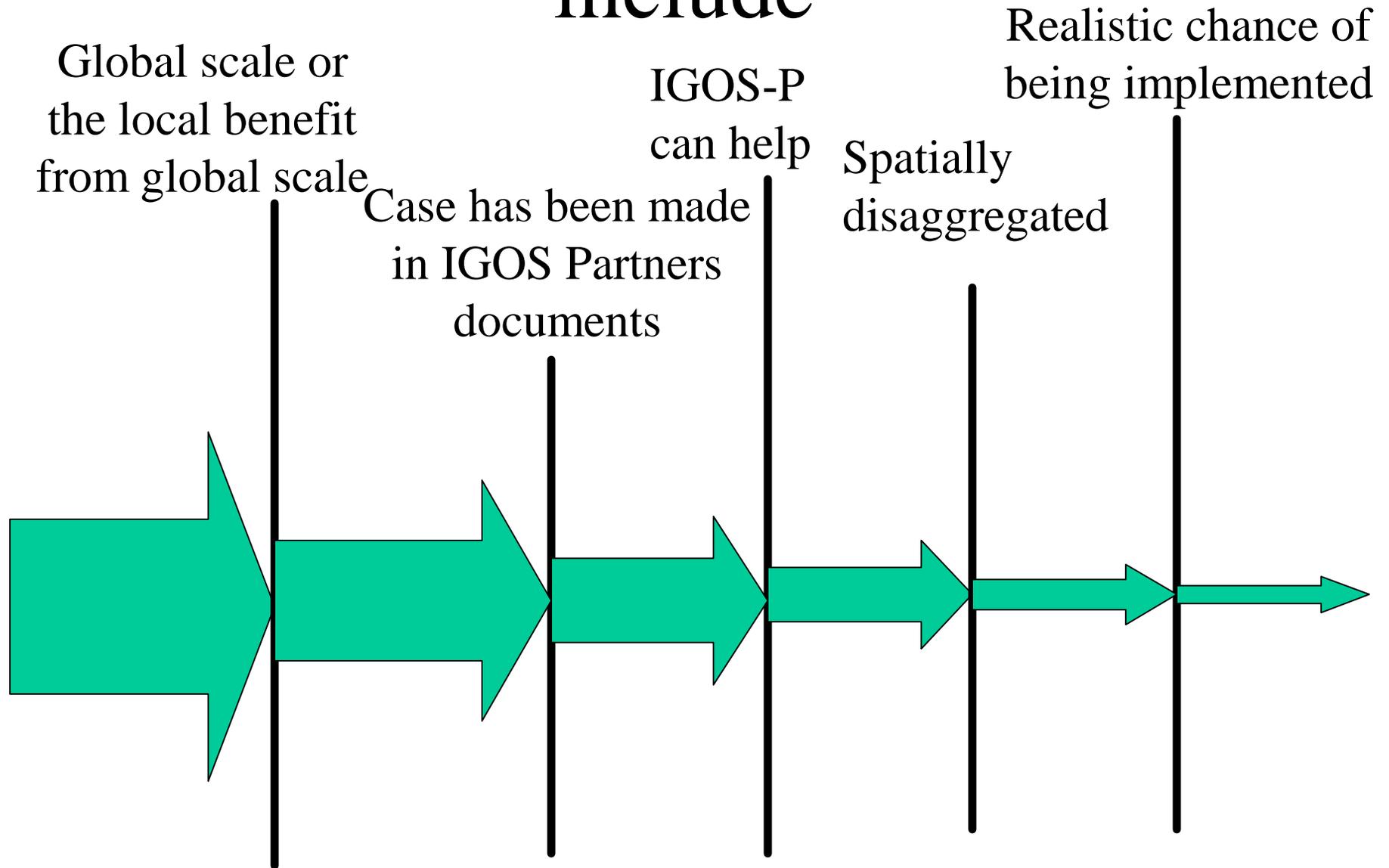
# The need for a Land Theme

- IGOS-P has not yet considered many observational needs relating to many aspects of the land
  - Sustainable economic development,
  - Natural resources management,
  - Conservation and biodiversity
  - Ecosystems
    - Functioning
    - Services
  - Biogeochemical cycling.
  - Multilateral environmental agreements.
    - development, implementation mandatory reporting and monitoring.
  - *Climate change and its impacts*
- The World Summit on Sustainable Development pointed to the need to *"Promote the development and wider use of earth observation technologies, including satellite remote sensing, global mapping and geographic information systems, to collect quality data on environmental impacts, land use and land -use changes."*

# Stake-holders

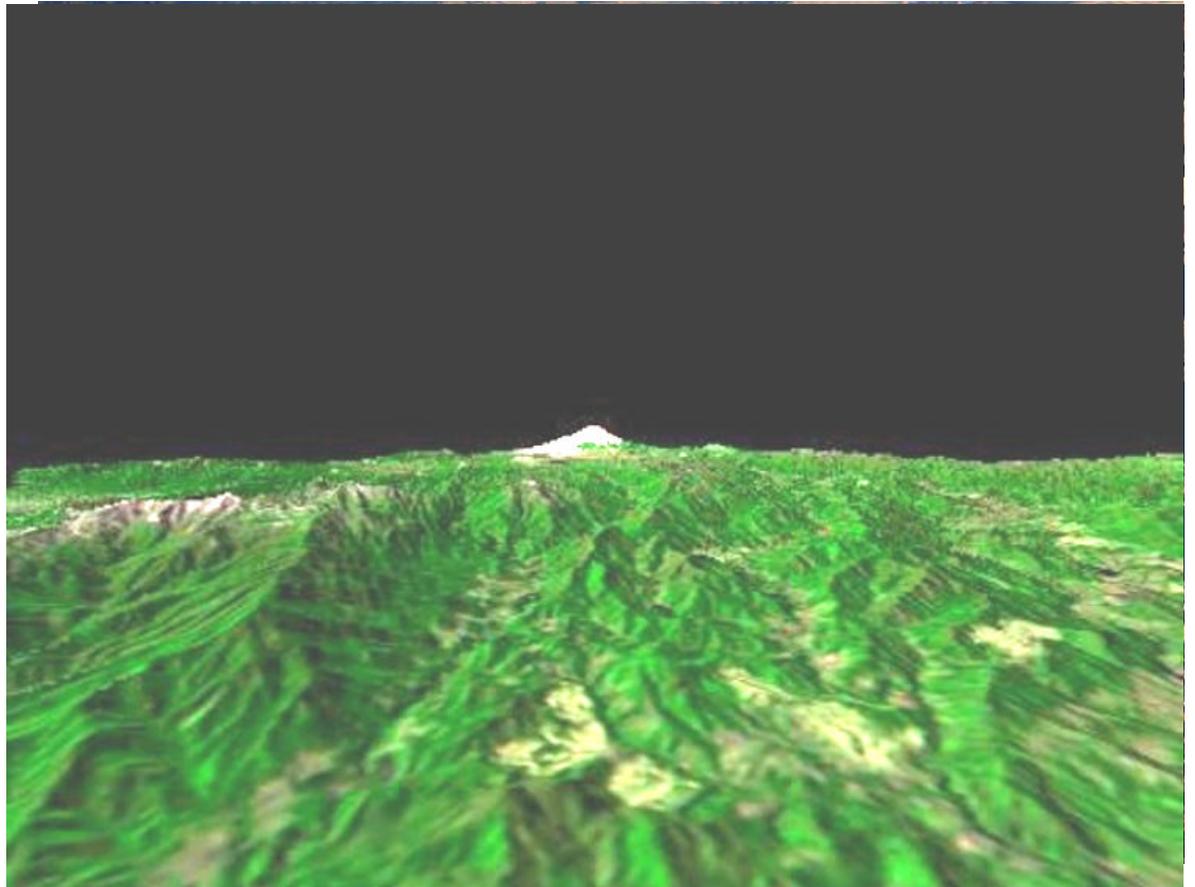
- International
  - UN organizations; international governmental actions such as G8; environmental conventions, aid agencies
- Scientific community
- National operational environmental agencies; decision support systems
- NGOs
- General public

# Deciding what to include and not include



# The main components of a Land theme

- Land Cover and Land Use
- Human settlement and population
- Managed ecosystems
  - Agriculture, pastoralism, forestry
- Natural ecosystems
  - Conservation, biodiversity, sustainable use.
- Soils
- Biogeochemical cycles
- Elevation



# Central role of Land Cover and Remote Sensing in the Land theme

- Reliable knowledge of land cover and land cover change is central to most aspects of a Land Theme.
- Remote sensing with selected *in situ* data collection has the potential to provide such information both locally regionally and globally.

# Roles and responsibilities

- International coordination mechanisms for observations
  - FAO (especially GTOS), UNEP, UNESCO, WMO
- Scientific research
  - IGBP, WCRP, IHDP
- Remotely sensed data and derived products
  - Space agencies; some activities now operational e.g. through NPOESS, most still research instruments only.
- Note that land observations are not well coordinated in many areas – need for improved mechanisms

# Milestones and work plan

- September 2004 Agreement on the scope of IGOL.
  - This will be as much concerned with what is not included as what will be.
- January 2004 the first preliminary statement will be made of needed enhancements.
- July 2005 the first draft of the plan will be completed
- December 2005 the final report will be submitted.

# Evaluation criteria

1. Identification of the specific contributions to the programs of IGOS-P partners if the recommendations are adopted.
2. Specific recommendations for improvements in space-borne observations (including improved continuity). Better understanding by CEOS members of land requirements that can be satisfied with improved space-based observations.
3. Improved international coordination for the assembly and exchange of terrestrial *in situ* observations.

# Resources

- The theme will only happen if some Partners (or members of Partners in the case of CEOS) are willing to put forward some realistic resources.
- Allocation of time of employees
- Some support of any non-agency personnel
- Coordination support (say 0.5 FTE for 18 months)
- Meeting costs
- Printing costs of report.
- Thanks to NRSCC, USGS, UNEP and FAO for early commitment to provide resources.

# Immediate first steps

- Early statement for GEO, if possible, of basic requirements for land cover and other key variables based on existing international publications..
- Take account of recent comments in final proposal
- Complete composition of theme team
- Identify the key questions for each of the areas where improved observations are crucially needed.
- Identify common cross-cutting observations between sub-themes.

# Proposed preliminary membership

- J. R. Townshend (GOFC/GOLD, GTOS)
- Dennis Ojima (IGBP)
- Alan Belward (GCOS)
- Christiana Schmullius (GOFC/GOLD)
- Jeff Tschirley (FAO),
- Olivier Arino (ESA)
- Chris Justice (GOFC/GOLD)
- Tony Janetos (Heinz Center)
- John Latham (GTOS)
- Timo Maukonen (UNEP)
- Roberta Balstad Miller (CIESEN)
- Jay Feuquay (USGS)
- Jiyuan LIU (CAS)

Group on Earth  
Observations

# Earth Observation Summit Participants



U.S. Department of State, Washington DC

July 31, 2003

# The current goal

- *“To monitor continuously the state of the Earth, to increase understanding of dynamic Earth processes, to enhance prediction of the Earth system, and to further implement our international environmental treaty obligations”, we need “timely, quality, long-term, global information as a basis for sound decision making” (Washington Summit Declaration). To provide this valuable information and to move from principles to action, we make this “10-Year Implementation Plan for establishing the Global Earth Observation System of Systems (GEOSS)” which should be “comprehensive”, “coordinated”, and “sustained” (Framework Document).*

## ***... system of systems...***

- The components of GEOSS consist of existing and future earth observation systems across the processing cycle from data collection to information production.
- The contributing systems maintain their responsibilities, ownership and mandates, but commit to making all or a portion of their observations available and easily accessible for collective use.
- GEOSS thus makes it possible to combine information from currently unconnected sources, in order to obtain a view that is sufficiently comprehensive to satisfy user needs.

# Topic areas

- Disasters (IGOS-P),
- Climate Change (GCOS, WCRP),
- Water Cycle (IGOS-P),
- Weather (WMO)
- Ecosystems Protection (IGOS-P)
- Agriculture,
- Energy,
- Human Health,
- Biodiversity

# Implementation of GOESS

- For 2005 and beyond, the implementation of the “10-Year Implementation Plan” will require a ministerial-guided successor mechanism with maximum flexibility—a single intergovernmental group for Earth observations drawing on the experience of the *ad hoc* GEO, with membership open to all interested governments and the European Commission, and with representatives of relevant international organizations taking part.
- The successor mechanism will provide generally for:
  - a. Coordination and planning of GEOSS implementation (*in situ* and remotely sensed);
  - b. Opportunities for engagement of all members and relevant international and regional organizations;
  - c. Involvement of user communities;
  - d. Measuring, monitoring, and facilitating openness of GEOSS to improve cross-flow of observations and products;
  - e. Co-ordination and facilitation of the development and exchange of observations and products between members and relevant international and regional organizations.